

1. Overview

Follow this guide when preparing cost estimates for all infrastructure projects. It is applicable to all infrastructure projects, including habitat and other "green" infrastructure projects, pipeline, storage, and other "gray" infrastructure projects.

Cost estimates prepared using this guide are used for the following purposes:

- helps with portfolio management and project prioritization
- developing proposed rates
- develop SPU's 6-year Capital Improvement Program (CIP)
- developing the CIP budget submittal
- evaluating options and making stage gate, value engineering, and other business decisions
- use in contract advertisements
- manage costs and ensure projects are completed within approved funding levels
- communicate project costs to internal and external stakeholders.

This guide provides templates and directions for preparing project cost estimates. You may need to supplement the guide with professional construction cost estimating expertise to develop high quality project estimates, especially on large or complex projects. If you can't find the answers to your cost estimating questions in this guide, please contact the Cost Estimating Guide support team at SPU_CEG@seattle.gov.

1.1. Frequency of Cost Estimate Updates

Cost estimates typically are prepared and/or updated at the following times:

- During Initiation, to obtain Stage Gate 1 approval;
- During Options Analysis, as part of the Stage Gate 2 business case;
- Immediately following Stage Gate 2 approval, as part of developing the Project Management Plan (PMP);
- At 30% Design;
- At 60% Design;
- At 90% Design;
- At Final Design, to obtain Stage Gate 3 approval;
- Following bid opening, to obtain Stage Gate 4 approval; and
- At regular intervals during Construction, including Closeout.

Unlike the initial estimate and other updates, the update prepared for the Stage Gate 2 business case includes estimates for each option. The economic analysis in the business case at Stage Gate 2 compares the present value of Triple Bottom Line life cycle costs for all options.

In addition to the updates listed above, cost estimates are updated as part of SPU's change management process and are reviewed monthly in the Enterprise Project Management System (EPMS) and annually as part of SPU's budget and spending plan development processes.

1.2. Cost Estimate Guide Diagrams

Figure 1-1 shows the step-by-step process used to develop and update cost estimates. The remainder of this guide follows the order of these steps and provides directions for each step. Each time you update a project cost estimate, you need to

update the Basis of Estimate and each Basis of Estimate update needs to describe what's changed.

Figure 1-2 shows the estimate components and how these components are aggregated.

Figure 1-3 shows cost estimate attributes and uses by project phase, including who is responsible for preparing estimates and updates, the expected approach and level of detail, the level of uncertainty at various times in the project delivery cycle, and the decision-making processes where cost estimates are used, including stage gates, rates and budgeting, and value engineering.

Figure 1-4 shows the methods used in each phase to estimate the main cost estimate components. The figure also shows how, as a project progresses through its phases, uncertainty decreases with successive updates of the cost estimate. As design details are developed, unknowns become known, the allowance for indeterminates decreases, identified risk events are passed, more rigorous estimating methods are used, actual project costs are incurred, the uncertainty in the estimated remaining project costs decreases, and the project reserves decrease.

**Figure 1-1:
Cost Estimating Process**

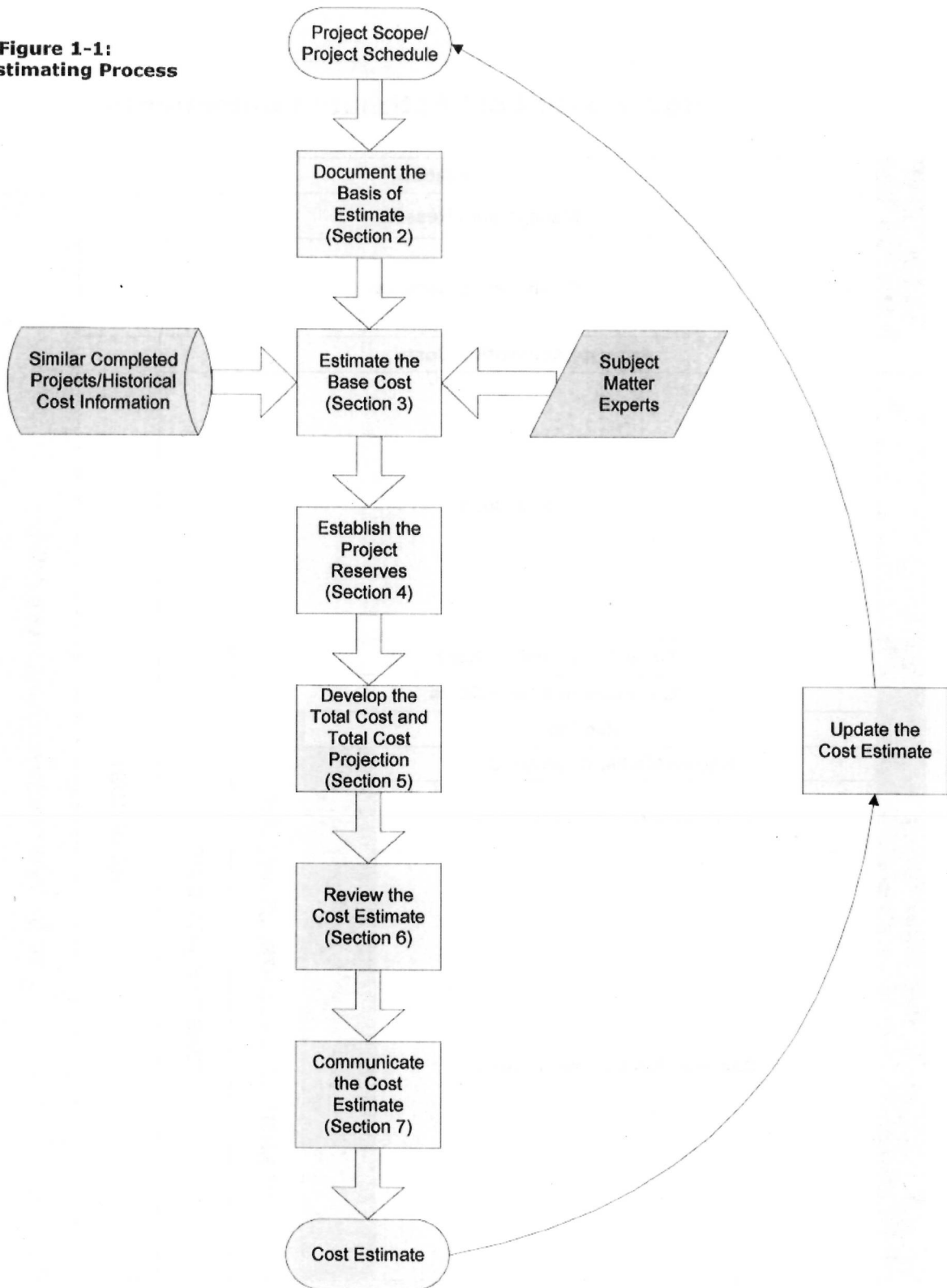


Figure 1-2: Cost Estimate Components

| | | | | | | |
|---|--------------------------------|--|------------------------------|-------------------------|-------------------|---|
| Reserves | Inflation | | | | | TOTAL COST PROJECTION (all costs escalated to year of projected spending) |
| | Management Reserve | | | | | |
| | Contingency Reserve | | | | | |
| Soft Cost | Property Acquisition Costs | | | | BASE COST | |
| | Soft Costs | | | | | |
| Hard Costs | Crew Construction Costs | | | | CONSTRUCTION COST | |
| | Miscellaneous Hard Costs | | | | | |
| | Sales Tax | | | CONSTRUCTION BID AMOUNT | | |
| | Known Market Conditions | | CONSTRUCTION CONTRACT AMOUNT | | | |
| | Allowance for Indeterminates | | | | | |
| | Construction Line Item Pricing | | | | | |
| TOTAL COST (expressed in today's dollars) | | | | | | |

Figure 1-3: Cost Estimate Attributes and Uses by Project Phase

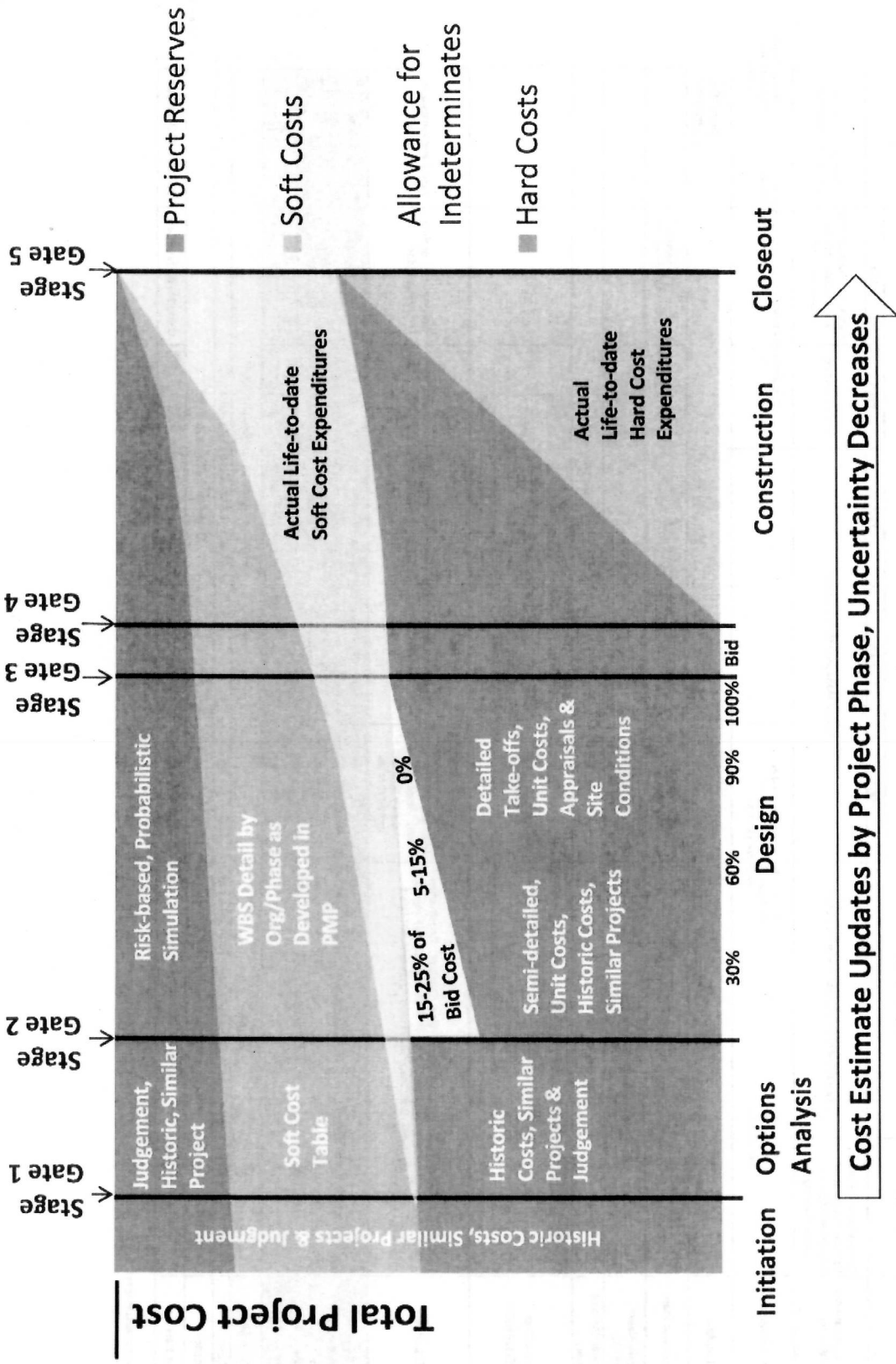
| Phase | Initiation | Options Analysis | Design | | | | Construction & Close Out | | |
|---|--|--|--|--|---|-------------------------------|-----------------------------------|--|--|
| | | | 30% | 60% | 90% | Final | Bid | | |
| What activity is cost estimate used or updated for? | Comprehensive Planning Portfolio Prioritization Project Identification Financial Planning | Feasibility Analysis>Select Preferred Option | Project Management and Control | | | | Ensure funding | Publish to inform bidders and validate / review contractor bid | Change orders and contractor negotiations |
| Stage Gate/Funding Request | | 1. Approve Funding for Options Analysis | 2. Approve Preferred Option, Funding for Design Placeholder for Total Cost Projection and O&M | | | | 3. Approve Construction Cost | 4. Approve Const. Contract | 5. Approve Project Close Out & Asset Costing |
| Rates and Budget | 6 Yr. CIP Budget, Annual Spending Plan | | | | | | | | |
| Project Management Plan | | May Be Used for Options Analysis | Cost Estimate Used to Set Baseline | | | | | Update Cost Estimate in PMP | |
| Value Analysis/ Value Engineering | | Estimate Required for VA | Updated Estimate Required for VE | | | | | | |
| Who's responsible for cost estimate? | | Specifier | Project Manager | | | | | | |
| AAACE Estimate Class (see AAACE for guidance) | Class 5 | | Class 3 | Class 2 | Class 1 | | | | |
| | | | | | | | | | |
| Basis of Estimate | | On Problem Statement/Project Objectives, Project Schedule, Construction Costs Based on Historical Unit Costs, Costs of Similar Completed Projects, and/or Expert Judgement. Soft Costs Based on SPU Recent Soft Costs. | Project Scope, Schedule, CCBS for construction cost and WBS for soft cost. Vendor Quote, industry data and historical costs. | Project Scope, Schedule, Preferred Design Solution, Construction Costs based on CCBS and Soft Costs based on WBS | | | Apparent Low or Best Value Bidder | Actual and Anticipated Cost | |
| Construction Bid Cost | | Historical Unit Costs, Costs of Similar Completed Projects, and/or Expert Judgement | Line Item Costs for Major Items and Equipment | Line Item Costs for Major Items and Equipment; Semi-detailed Line Item Unit Costs for Remainder | Line Item Costs for Major Items and Equipment; Increased Detailing of Remainder | Detailed Take Off, Unit Costs | Apparent Low or Best Value Bidder | Including Change Orders | |
| Allowance for Indeterminates | | Included in Base Cost | 15% to 25% of Bid Cost | 5% to 15% of Bid Cost | 0% to 5% of Bid Cost | 0% of Bid Cost | N/A | N/A | |
| Property/Permit Fees | | Include KC assessment if site determined | Desktop Geotech, Property based on KC Assessor and \$/sq ft for Elements | Based on Appraisals and Site Conditions | | | | | |
| Soft Cost | | Recent SPU Soft Costs | By Phase/Orig. Based on Recent SPU Soft Costs | Based on PMP and Consultants SOW | | | | | |
| Contingency | | 25% to 40% of Base Cost | 15% to 25% of Base cost | Based on PMP Risk Register | | | | | |
| Management Reserve | | 10% to 25% of Base Cost | 10% to 20% of Base Cost | 5% to 15% of Base Cost | 5% to 10% of Base Cost | 0% to 5% of Base Cost | 0% to 5% of Base Cost | 0% to 5% of Base Cost | 0% to 5% of Base Cost |

Total Cost
(in today's dollars);
Total Cost
Projection
(all costs
escalated
to year of
projected
spending)

Base
Cost

Reserves

CIP - Capital Improvement Project, SOW - Scope of Work, CCBS - Construction Cost Breakdown Structure, WBS - Work Breakdown Structure, KC - King County, PMP - Project Management Plan,



2. Document the Basis of Estimate

The **Basis of Estimate** summarizes the information, assumptions, and methodology used to develop a project cost estimate. A well-prepared Basis of Estimate helps people develop, understand, use, and update a cost estimate, and helps avoid estimating errors and omissions. Each time you update an estimate, update the Basis of Estimate and show what has changed. During the Options Analysis phase, complete one Basis of Estimate template, noting any differences between the alternatives that are being considered. If the options are substantially different, complete a separate Basis of Estimate for each alternative.

The topics you'll need to cover in a Basis of Estimate are listed below. Some may find it easier to go directly to the template, which includes instructions:



Tools and Templates

- [Basis of Estimate Template](#)

2.1. Determine the Appropriate Level of Detail

Use your best judgment to determine the appropriate level of detail in the Basis of Estimate. Consider the project size and complexity, the type of project, the degree of project definition (well-defined versus vague), and the number and type of estimate assumptions. The Basis of Estimate should include enough detail to communicate key assumptions, to enable an independent review of the estimate, and to provide a basis for change management.

2.2. Complete the Basis of Estimate Template

You'll need to provide basic template information, including the project name, activity number(s), line of business, estimate date, names and roles of the estimators, and current project phase. A complete Basis of Estimate also includes the following information:

- Project Objectives
- Project Scope
- Project Location, including constraints and site issues
- Project Schedule
- Project Labor Resourcing Strategy
- Construction Contracting Strategy
- Cost Estimating Methodology and Sources of Information
- Allowances
- Other Assumptions
- Exceptions
- Risks
- Estimate Reviews
- How and Why the Estimate Has Changed (with each update)
- Benchmarking
- Reference Documents

Before Stage Gate 2 you may not have some of this information, but after Stage Gate 2 all of these sections should be completed. You may find it helpful to keep an estimate variance log to track how and why your estimate has changed. Benchmarking is especially helpful on projects with high cost uncertainty and/or significant changes in the overall estimate.

2.3. Where to Get Additional Information

Additional information on preparing a Basis of Estimate is available from the Association for the Advancement of Cost Engineering (AACE), Recommended Practice No. 34R-05, Cost Estimating and Budgeting - Basis of Estimate.

Basis of Estimate

Provide the information described in red and then delete the red text.

| | |
|-------------------------------|--|
| Date Estimate Prepared | <<enter date>> |
| Project Phase | <<Initiation, Options Analysis, 30/60/90/Final>> |
| AACE Estimate Class | <<Class 1, 2, 3, 4, or 5>> |

1. Project Information

| | |
|-----------------------------|--|
| Project Name | |
| Activity Number | |
| Specifier | |
| Project Manager | |
| Cost Estimator(s) | |
| Estimate Reviewer(s) | |

2. Objectives

Provide a concise description of the project purpose and objectives. This information should match the "Key Drivers for the Project" section of the Stage Gate 2.

<<enter text here>>

3. Scope

Provide a brief description of the project scope of work, including the type of project (e.g., sewer rehab, water reservoir, etc.) and each major item of work. Note whether there are any new or modified structures or structures that must be demolished and whether the work will require any shut-downs or connections. Note that, for projects that have passed Stage Gate 2, the project scope statement can be taken from the Project Management Plan.

<<enter text here>>

4. Location

Identify the project location; any site constraints that may affect access, mobilization, or construction; and any significant site issues that must be addressed (e.g., wetlands, hazardous materials, and/or archaeological impacts). Be sure to consider how the site has been used historically, and identify any site contamination or other problems that may exist as a result.

<<enter text here>>

5. Schedule

This information should match the "Schedule" section of the Stage Gate 2; after SG2, refer to the Project Management Plan. Summarize the anticipated project schedule, or attach the project schedule if there is a current version that includes anticipated stage gates, key milestones and deadlines, and any construction windows or other schedule constraints. Projects that have passed Stage Gate 2 should include increasingly detailed schedules.

<<enter text here>>

6. Labor Resourcing Strategy (optional for Stage Gate 1)

Identify what work will be performed by SPU and what work will be performed by consultants, if any. For the work performed by SPU, identify what branch and division will provide the resources. For the work to be performed by consultants, describe the approach and schedule you will use to procure consultant services. Identify any field crew construction resources that will be needed. Describe any assumptions regarding workweek schedule and overtime.

<<enter text here>>

7. Construction Contracting Strategy (optional for pre-Stage Gate 2)

Note the planned contracting approach (e.g., design-bid-build, General Contractor/Construction Manager, design-build, job order contract). Summarize any construction assumptions, work hour constraints and seasonal supply or construction constraints. Note if SPU is providing materials or other scope items to the contractor.

<<enter text here>>

8. Cost Estimating Methodology and Sources of Information

For projects projects at Stage Gate 2 or before, the basis of estimate should detail all assumptions that support the dollar amounts associated with all Cost Items.

List the primary estimating methodology(ies) used for the construction cost estimate:

- Historical unit costs (\$/MG, \$/SF, \$/LF),
- Similar completed project costs,
- Professional cost estimating judgment,
- Semi-detailed unit costs,
- Detailed unit costs

List the primary estimating methodology(ies) used for the soft cost estimate:

- SPU Cost Estimating Guide Table 3.2 (through Stage Gate 2)
- Estimates from the Project Management Plan (following Stage Gate 2)

List the engineering deliverables used to prepare the construction cost estimate:

- Design assumptions,
- Conceptual drawings/plans (XX% design),
- Specifications,
- Equipment lists

List the sources of information used in the estimate, including:

- Pricing sources for construction and consultant costs, such as ASCE Cost Curves, SPU Unit Cost Report, RSMeans, King County's Tabula planning tool estimator, other projects, etc. and what these costs include (contract line items, an Allowance for Indeterminates, sales tax, permit fees, construction phase survey and materials testing, and/or crew construction costs)
- Tax rates as applicable
- Construction cost indices and/or market condition adjustments used to update historical costs to estimates expressed in today's dollars
- Real Property pricing source, if applicable

<<enter text here>>

9. Allowances

Identify any allowances included in the estimate and how they were determined, including how the Allowance for Indeterminates (AFI) was determined.

<<enter text here>>

10. Other Assumptions

Identify any additional assumptions that may affect the cost estimate, including any assumptions about work that will NOT need to be performed.

<<enter text here>>

11. Exceptions

Identify any variances to SPU's cost estimating practices and any significant deviations from the deliverables normally required for the current phase.

<<enter text here>>

12. Risks

This information should match the "Key Risks & Issues" section of the Stage Gate 2; after SG2, refer to the Project Management Plan. Identify any part of the cost estimate having significant risk. Provide a copy of the project Risk Register from the PMP Process if one has been prepared. In particular, identify the cost and schedule elements that have high or critical risk values.

<<enter text here>>

13. Estimate Reviews

Describe all estimate reviews to date and the results. Identify any additional planned estimate reviews.

<<enter text here>>

14. How and Why the Estimate Has Changed

Summarize the differences between the original estimate and each update, so that the reader understands how the estimate has changed and why. A detailed reconciliation or cost trending report may be included as an additional attachment if necessary on large, complex projects.

<<enter text here>>

15. Benchmarking

Describe any cost benchmarking performed with similar projects and the results. Explain any significant differences in cost or efficiency.

<<enter text here>>

16. Attachments

Include any attachments referred to in the Basis of Estimate (e.g., project schedule).

<<enter text here>>

Basis of Estimate

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|-------------------------------|--|
| Date Estimate Prepared | <<enter date>> |
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- Conceptual drawings/plans (XX% design),
- Specifications,
- Equipment lists

List the sources of information used in the estimate, including:

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- Construction cost indices and/or market condition adjustments used to update historical costs to estimates expressed in today's dollars
- Real Property pricing source, if applicable

<<enter text here>>

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<<enter text here>>

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<<enter text here>>

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<<enter text here>>

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<<enter text here>>

15. Benchmarking

Describe any cost benchmarking performed with similar projects and the results. Explain any significant differences in cost or efficiency.

<<enter text here>>

16. Attachments

Include any attachments referred to in the Basis of Estimate (e.g., project schedule).

<<enter text here>>

3. Estimate the Base Cost

The **Base Cost** is the sum of life-to-date and remaining project costs except Project Reserves, expressed in today's dollars. The Base Cost includes all Hard Costs, Soft Costs and Property Acquisition.

Hard Costs include contractor construction costs, an Allowance for Indeterminates (prior to 90% Design), an adjustment for market conditions when applicable, sales tax (see [Appendix B – Sales Tax Guide](#)), permit fees, construction phase survey, construction materials testing, and crew construction costs. **Soft Costs** are non-construction labor costs. See [Appendix A – Hard and Soft Costs Guide](#) and [Appendix D – Labor Overhead, Miscellaneous Fees](#) for additional details. Property Acquisition costs are the actual cost associated with purchasing property rights for the project, not including labor.

The **Allowance for Indeterminates** covers the estimated cost of known construction scope that cannot yet be quantified at a particular stage of design development; the Allowance for Indeterminates should be highest at 30% Design, decrease as design details are flushed out, and be negligible at 90% Design.

What follows are the steps for preparing the Base Cost, listed in the order they should be followed. Some may find it easier to jump directly to the Cost Estimate Template.



Tools and Templates

- [Cost Estimate Template](#)

3.1. Estimate the Construction Bid Amount¹

3.1.1. Before Stage Gate 2 Approval

- A. Estimate the construction bid amount using historical unit costs² (for example, tools like King County's [Tabula](#) for estimating conveyance costs; or other historical data expressed in cost/linear foot, cost/square foot, cost/gallon, etc.); the construction costs of similar completed projects³; or professional cost estimating judgment. As shown in Table 3-1, it's assumed costs from similar completed projects already include an Allowance for Indeterminates.

Cost Items used to calculate an estimate at this phase should only be for the major items of work. Each cost item should include all work required to construct that major item of work. There may only be one cost item on some projects (combined sewer pipe), or several (stormwater pipe, storm water tank, storm water above ground storage), but usually not more than 5 major cost items to a project. It is important to document the assumptions behind the Cost Items in your basis of Estimate.

¹ The estimated Construction Bid Amount is sometimes called the engineer's estimate.

² Estimates based on historical unit cost data (e.g., cost/linear foot, cost/square foot, cost/gallon) are also called **parametric cost estimates**.

³ Estimates based on completed similar projects are also called **analogous cost estimates**.

- B. Adjust your estimate to reflect any known market conditions. For example, in recent years professional cost estimators added up to 10% to construction costs to account for the impact of global construction on public works construction in Seattle. Similarly, you may need to subtract an amount for past market conditions to adjust estimates to today's construction climate. SPU Finance determines when it is appropriate for cost estimates to include an adjustment for market conditions.

3.1.2. After Stage Gate 2 Approval

Include the Stage Gate 2 construction cost estimate, modified if necessary to reflect the approved scope of work, in the Project Management Plan (PMP) that is prepared immediately following Stage Gate 2. For projects that have reached 30% Design (and projects not yet at 30% Design if there is enough information to prepare a Class 3 estimate), follow the steps in this section, which parallel this equation:

Bid Amount = Line Item Pricing + AFI + Market Condition Adjustment (if any)

- A. Choose American Public Works Association (APWA) formatting for pipeline projects and other horizontal construction or Construction Specifications Institute (CSI) formatting for storage facilities, pump stations, and other vertical construction.
- B. In the Cost Estimate Template, populate the Construction Contract Amount Worksheet with bid items and quantity estimates from the APWA and CSI Bid Item lists.

| Item | Bid Item | Bid Item Description | Quantity | Unit | Unit Price | |
|------|----------|--|----------|------|-------------|----|
| 1 | 107005 | SAFETY AND HEALTH PROGRAM | | LS | \$ 2 000.00 | \$ |
| 2 | 107010 | PERSONAL PROTECTIVE EQUIPMENT, LEVEL B | | PDAY | \$ 500.00 | \$ |
| 3 | 109005 | MOBILIZATION | | LS | \$ - | \$ |
| 4 | | | | | | \$ |

Be sure to include the contractor's costs for any environmental remediation or demolition work, and always include the contractor's costs for commissioning and startup, including the cost of spare parts.

- C. Add estimated bid item costs and unit costs, and include contractor overhead, mark-ups, and profit within the unit costs.
- D. The worksheet automatically multiplies the quantities and unit costs to obtain a unit price extension and sums the results to obtain the Construction Line Item Pricing.
- E. Add an Allowance for Indeterminates (AFI) equal to a percent of the Construction Line Item Pricing to obtain the Construction Bid Amount. Use Table 3-1 as a guide for determining the AFI%. Label the new total the Construction Bid Amount. Use the upper end of the range when there are more design details remaining to be developed and the lower end of the range when there are fewer design details remaining to be developed.

Table 3-1: Allowance for Indeterminate (AFI) Ranges

| Project Phase | AACE Estimate Class | Amount to Include for AFI (Expressed as a % of Line Item Pricing) |
|------------------|---------------------|---|
| Initiation | Class 5 | Already included in historical data/ actual costs from similar projects |
| Options Analysis | Class 4 | Already included in historical data/ actual costs from similar projects |
| 30% Design | Class 3 | 15 - 25% |
| 60% Design | Class 2 | 5 - 15% |
| 90%/Final Design | Class 1 | 0% |

F. Adjust your estimate to include known market conditions if necessary. SPU Finance determines when it is appropriate to include an adjustment for market conditions.

3.2. Estimate Sales Tax and Construction Contract Amount

Multiply the Construction Bid Amount by the applicable sales tax rate to obtain the estimated sales tax. Add the resulting sales tax to the Construction Bid Amount and label it Construction Contract Amount:

Construction Contract Amount = Construction Bid Amount + Sales Tax

If your Construction Bid Amount is based on historical data or the costs of similar completed projects, make sure sales tax isn't already included in the historical data.

3.3. Estimate the Construction Cost

3.3.1. Estimate Miscellaneous Hard Costs

Estimate the cost of permit fees (not including the costs to prepare permit applications, which are included in the project Soft Costs). Also estimate the costs to conduct construction phase site survey work and construction phase materials testing by adding the SPU-provided labor, overhead, and materials costs. Enter each of these costs as line items in the cost estimate. If your estimate is based on historical data or the costs of similar completed projects, make sure these costs aren't already included in the historical data. See Appendix A – Hard and Soft Costs Guide for additional details on miscellaneous hard costs.

3.3.2. Estimate Crew Construction Costs

Estimate the crew construction costs by adding the SPU-provided labor, overhead, equipment, and material costs. If your estimate is based on historical data or the costs of similar completed projects, make sure these costs aren't already included in the historical data.

3.3.3. Total the Construction Cost/Hard Cost

Construction Contract Amount
 Miscellaneous Hard Costs
 + Crew Construction
 Construction Cost

Construction Cost = Hard Costs

3.4. Estimate Soft Costs

3.4.1. Before Stage Gate 2 Approval

If the project is in Initiation or Options Analysis, use actual soft cost percentages by project phase from recently completed SPU infrastructure projects as a guide (see Table 3-2). If you adjust the percentages based on professional judgment, document the reasons in your Basis of Estimate.

Table 3-2: Soft Costs by Phase (Expressed as % of Hard Costs)⁴

| Project Phase | Soft Costs as a Percent of Hard Costs | | | |
|------------------|---------------------------------------|-------------------------|-----------------------------|-------------------------|
| | Large Projects ⁵ | | Small to Mid-Sized Projects | |
| | Water | Drainage and Wastewater | Water | Drainage and Wastewater |
| Initiation | 0.8% | 1% | 1% | 1.2% |
| Options Analysis | 2.3% | 3% | 3% | 3.7% |
| Design | 19.5% | 24.5% | 25% | 30% |
| Construction | 15.7% | 19.6% | 20% | 23.9% |
| Closeout | 0.8% | 1% | 1% | 1.2% |
| Total | 39% | 49% | 50% | 60% |

Table 3-3: Soft Costs Expressed as a Percent of Hard Costs and as a Percent of Total Cost

| Type of Project | Soft Costs as a Percent of Hard Costs | Soft Costs as a Percent of Total Cost |
|---|---------------------------------------|---------------------------------------|
| Large water projects (TCP>\$5M) | 39% | 28% |
| Large drainage or wastewater projects (TCP>\$5M) | 49% | 33% |
| Small to mid-size water projects | 50% | 33% |
| Small to mid-size drainage or wastewater projects | 60% | 38% |

⁴ Table 3-2, Table 3-3 and Table 3-4 are based on 130 projects completed between 1998-2010

⁵ For Table 3-2 and Table 3-3, large projects have a Total Cost Projection > \$5M

3.4.2. After Stage Gate 2 Approval

After Stage Gate 2 approval, project teams use the Project Management Methodology to estimate soft costs through the development of a Project Management Plan (PMP). Be sure to include life-to-date labor and externally driven Soft Costs such as the public works contracting fees charged by the Department of Finance and Administration (FAS) and SPU non-construction vehicle O&M costs. Once you have finished estimating the Soft Costs in the PMP, use Table 3-4 as a reality check.

Table 3-4: Soft Costs by Low Org

| SPU Branch | Low Org | Division or Section | Soft Costs as % of Hard Costs | Soft Costs as % of Total Cost |
|--------------------------------|------------------------|---|-------------------------------|-------------------------------|
| Project Delivery | WS480 | Project Management & Engineering Division | 23.5% | 15.3% |
| | WS434 | Technical Resources | 1.4% | 0.9% |
| | WS433 | Land Survey | 1.1% | 0.7% |
| | WS424 | Contracts & Standards | 2.0% | 1.3% |
| | WS421 | Construction Engineering | 7.4% | 4.8% |
| | WS422 | Contract Administration | 1.4% | 0.9% |
| | WS423 | Materials Lab | 1.6% | 1.0% |
| | Other | various | 0.7% | 0.5% |
| | Total Project Delivery | | 39.0% | 25.4% |
| Utility Systems Management | | | 5.3% | 3.4% |
| Field Operations & Maintenance | | | 3.8% | 2.5% |
| F&A, Director's Office | | | 1.4% | 0.9% |
| Customer Service | | | 1.1% | 0.7% |
| Other | | | 3.2% | 2.1% |
| Total Soft Cost | | | 53.9% | 35.0% |

3.5. Estimate Property Acquisition Costs

Estimate the property acquisition costs. Include only the cost of the property and/or easements; **do not include the labor or other costs of negotiating sales price or property agreements.**

3.6. Compile the Base Cost

Hard Costs + Soft Costs + Property Acquisition Costs = Base Cost

4. Establish Project Reserves

Project Reserves are the combination of Contingency Reserve and Management Reserve. **Contingency Reserve** is an amount added to the Base Cost to cover identified risk events that occur on the project, excluding changes in project scope; once a project has passed Stage Gate 2, these risks and contingency response plans are identified in the Risk Management Plan. **Management Reserve** is an amount added to the Base Cost to cover unidentified risk events that occur on the project, including minor changes in project scope. Examples of Contingency Reserve and Management Reserve are provided in Appendix G.

Figure 1-4, from Chapter 1 shows how Project Reserves are drawn down as a project is delivered. What follows are the steps for establishing the Project Reserves, which are entered on the Cost Estimate Template.



Tools and Templates

- Cost Estimate Template

4.1. Determine the Contingency Reserve

4.1.1. All Projects Before Stage Gate 2 Approval

Before Stage Gate 2 approval, establish the Contingency Reserve by adding an appropriate percentage of the Base Cost (see Table 4-1). The lower end of each range assumes that the known risks have lower probability and/or consequences. The higher end of each range assumes that the known risks have higher probability and/or consequences. Unusually complex or simple projects may use higher or lower contingencies, respectively.

Summarize known project risks and their probability and consequences in your Basis of Estimate, and use the information to determine the appropriate Contingency Reserve using the ranges provided in Table 4-1. If your estimate is based on unit costs (e.g., cost/linear foot, cost/square foot, cost/gallon), make sure Contingency Reserve isn't already included in the unit costs.

Table 4-1: Contingency Reserve Guidelines Through Stage Gate 2

| Project Phase | AACE Estimate Class ¹ | Contingency Reserve as % of Base Cost |
|------------------|----------------------------------|---------------------------------------|
| Initiation | Class 5 | 25 – 40% |
| Options Analysis | Class 4 | 15 – 25% |

¹ See the AACE Cost Estimate Classification System for details

4.1.2. Most Projects Following Stage Gate 2

After projects pass Stage Gate 2, project teams follow SPU's Project Management Methodology to develop a Risk Plan. One of the outcomes of developing a Risk Plan is a Contingency Reserve amount which is based on the probability and impact of risks chosen to be covered by a contingency response plan. The range of risks evaluated includes but is not limited to the following:

- Clarity and degree of project definition
- Size and complexity of project
- Inclusion of new technology on the project
- Quality of reference cost data
- Maturity of organizational and management system and control processes
- Experience of project team

4.1.3. Some Large Projects Following Stage Gate 2

SPU is interested in using Probabilistic Simulation to establish Contingency Reserve on large projects (greater than \$5M Total Cost Projection). This Guide will be revised to include directions after the approach is piloted on a few projects.

Probabilistic Simulation is a mathematical method used to quantitatively assess project risk. The first step involves identifying bid items (from the Construction Cost Estimate) and risk items (from the Risk Register) that have high cost variability or high schedule variability, either of which can have a significant impact on project cost. Then, a computer program is used to perform repetitive calculations where the estimated cost of each of these variable items is selected randomly from within the most probable range. The result is a range of possible cost outcomes and the probabilities they will occur. The Contingency Reserve is set based on the difference between the Base Cost and the estimated likely-to-not-exceed cost corresponding to a selected % confidence level.

If your project is in the pilot group, during development of the Risk Management Plan you will need to work with a specialist who has working knowledge of a Probabilistic Simulation computer software program (for example, Crystal Ball, @RISK), in order to run the simulation, analyze the results, and set a Contingency Reserve.

4.2. Determine the Management Reserve

Establish the Management Reserve by adding a percentage of the Base Cost, as shown in Table 4-2. The lower end of each range assumes there is a high degree of confidence the project will not have a lot of unanticipated costs. The higher end of each range assumes there are a lot of unknowns on the project so it is anticipated there will be a higher level of unanticipated costs. Unusually complex or simple projects may use higher or lower Management Reserve respectively. Be sure to summarize project unknowns in your Basis of Estimate, and use this information to determine the appropriate Management Reserve target from the range provided in Table 4-2.

Table 4-2: Management Reserve Guidelines

| Project Phase | AACE Estimate Class² | Management Reserve as % of Base Cost |
|----------------------|--|---|
| Initiation | Class 5 | 10 – 25% |
| Options Analysis | Class 4 | 10 – 20% |
| 30% Design | Class 3 | 5 – 15% |
| 60% Design | Class 2 | 5 – 10% |
| 90%/Final Design | Class 1 | 0 – 5% |

4.3. Compile the Project Reserves

Add the Contingency and Management Reserves to obtain the Project Reserves.

² See the AACE Cost Estimate Classification System for details

5. Develop the Total Cost and the Total Cost Projection

The **Total Cost** is the sum of the Base Cost and the Project Reserves, expressed in today's dollars. The **Total Cost Projection** is the Total Cost escalated to the expected year of spending. **Escalated estimates** are calculated by adding expected inflation to estimates that have been calculated in today's dollars.

With the exception of the Stage Gate 2 options analysis (when Total Cost is used to ensure an "apples to apples" comparison of the options), Total Cost Projection is used as the estimated project cost for all internal and external communications, reporting, and decision-making because it is the best estimate of how much money will have been spent when the project is complete.

What follows are the steps for preparing the Total Cost and the Total Cost Projection. Some may find it easier to jump directly to the template.



Tools and Templates

- [Cost Estimate Template](#)

5.1. Compile the Total Cost

Base Cost + Project Reserves = Total Cost.

5.2. Forecast the Cash Flow

Spread the Total Cost in a cash flow forecast, showing life-to-date actual costs and projected expenditures by year, expressed in today's dollars and based on the project schedule. The cash flow should take into consideration the 2-month lag that typically occurs between completion of consultant and construction contractor work, invoicing, and payment. If the project schedule changes, you will need to adjust and re-escalate the cash flow.

5.3. Escalate the Cash Flow to the Projected Year of Spending

Multiply the annual cash flow by the [approved annual rate of inflation](#). Use the resulting cash flow in EPMS and anywhere project cash flow is reported.

5.4. Obtain the Total Cost Projection

Total the life-to-date actual costs and the escalated annual spending forecasts. The result is the Total Cost Projection. Use the Total Cost Projection whenever you need to provide an estimate of what the project will cost, including when you request AMC funding authorization, when you report total cost projections in EPMS, and when you tell SPU management, elected officials, stakeholders, or the community what the project will cost.

5.5. Express Total Cost Projection in a Range

Once the Total Cost Projection is developed, you'll need to present it as a "most likely" estimate as well as in a range that communicates the relative uncertainty of

the estimate. Use the AACE Cost Estimate Classification System as a guide. Typical ranges are summarized in Table 5-1. Apply the ranges to the Total Cost Projection to obtain the estimated cost range. Note that cost ranges are used only to communicate the level of cost uncertainty; they are not part of the authorized project spending nor are the ranges tracked in SUMMIT or EPMS.

Table 5-1: Typical Range of Estimate Uncertainty by AACE Class Estimate

| Project Phase | AACE Estimate Class | Typical Uncertainty as a Range, % |
|------------------|---------------------|-----------------------------------|
| Initiation | Class 5 | -30% to +50% |
| Options Analysis | Class 4 | -20% to +30% |
| 30% Design | Class 3 | -15% to +20% |
| 60% Design | Class 2 | -10% to +15% |
| 90%/Final Design | Class 1 | -5% to +10% |

6. Review the Cost Estimate

Estimates are checked for quality and accuracy and to ensure that they are organized correctly and include all required information.

What follows are the steps for conducting an estimate review. Some may find it easier to jump directly to the checklist, which includes instructions.



Tools and Templates

- [Estimate Review Checklist](#)

6.1. Determine the Appropriate Types of Review

All estimate reviews start with a first level or supervisor's review. The next required step for all projects that have reached 30% design is a detailed review, which is scaled in scope and magnitude to be commensurate with the size and complexity of the project. Cost estimates for large and/or complex projects may also be reviewed by other internal groups, external reviewers, and management. Independent estimates may also be prepared as needed. Project size and complexity are the most important drivers in determining whether these additional types of review are appropriate.

Review responsibilities are summarized in Table 6-1.

Table 6-1: Estimate Review Responsibilities

| Type of Review | When | Who | Which Projects |
|--|--|-----------------------------------|---|
| First level | Each estimate and update | Supervisor or designated reviewer | All projects |
| Detailed Review | 30%, 60%, 90%, and final design | In-house or consultant | All projects |
| Review Estimates By Others/Consultants | Each estimate and update | In-house | All estimates prepared by consultants |
| Independent Cost Estimate | Options Analysis phase (as part of alternatives analysis) | In-house or consultant | When the top two options are close in cost and there is no clear best choice. |
| Independent Cost Estimate | With Value Engineering process (at or before 30% design) and as needed | In-house or consultant | Total Cost Projection > \$5 million |

Before you have the reviewers begin the estimate review process, you may want to prepare a second version of the construction cost estimate that lists the construction cost items in order of magnitude (i.e., highest cost line items at the top, lowest at the bottom). That way, reviewers can focus on the cost items that contribute to about 80% of the cost (usually on a single page), and check to see if they are reasonable.

This expedites review and avoids having the reviewer focus on cost items that do not contribute significantly to the overall cost.

6.2. Complete the First Level Review

Usually the supervisor of the person who prepared the estimate conducts this review, but the role may be assigned to a designated person with cost estimating experience.

- A. Check the Basis of Estimate to ensure it is correct and complete. Make sure the scope, assumptions, and estimating approach and methodologies are described clearly. Verify that the estimating methodologies are appropriate to the state or class of the project. Confirm that any significant changes from previous estimates are identified and explained.
- B. Check the math – quantities, prices and arithmetic. Spot-check spreadsheet formulas and totals.
- C. Confirm that the overall cost and schedule are reasonable for the project scope, size, location and complexity.
- D. Verify that allowances and multipliers are appropriate to the stage or class of the estimate.
- E. Ensure that detailed and summary information is presented in the proper format.
- F. Ensure that backup information is organized, and that it's easy to see how the backup information supports information in the estimate summary.
- G. Document your findings and return the estimate to the cost estimator, who is responsible for reconciling and revising the estimate as needed to respond to review comments.

6.3. Complete the Detailed Review

Detailed reviews are performed for all projects that have reached at least 30% design. Ideally, they are performed by people with cost estimating experience who are familiar with the type of work in the project and who have not been involved in developing the cost estimate. On large projects, you may want to have another City department, SPU Branch, PDB project team, or consultant (if skilled City cost estimators are not available) conduct the review to ensure objectivity.

Detailed reviews start with the steps A-F, listed in the section 6.2. In addition:

- A. Spot-check in detail any cost items that would have significant cost impacts if estimated incorrectly. You may need to consult with design engineers, construction managers, or other estimators on specialty equipment and work. On large cost items of larger projects, your spot check may need to include a quick takeoff from the pertinent plans or a separate estimate using a different estimating methodology.
- B. Whenever possible, validate the estimate by comparing the cost and schedule to similar past projects, verifying that hard and Soft Costs are reasonable, Project Reserves are appropriate, etc.

- C. Document your findings and return the estimate to the cost estimator, who is responsible for reconciling and revising the estimate as needed to respond to review comments.

6.4. Review Construction Estimates Prepared by Others

When arrangements are made to have construction cost estimates prepared by other departments or consultants, the SPU lead (the project specifier if it is prior to a Stage Gate 2 decision and the project manager if the project has passed Stage Gate 2) must provide clear expectations (regarding level of detail, estimating methodology, extent of documentation, etc.) and must confirm who will conduct the first level and detailed reviews. Once the construction cost estimate is complete and reviewed, the SPU lead (the project specifier if it is prior to a Stage Gate 2 decision and the project manager if the project has passed Stage Gate 2) must also check the construction cost estimate, including:

- A. Confirm that the Basis of Estimate and construction cost estimate are complete, in the proper format, and at an appropriate level of detail for the stage or class of the estimate.
- B. Confirm that any significant changes from previous estimates are identified and explained.
- C. Spot-check the math.
- D. Confirm that the overall cost and schedule are reasonable for the project scope, size, location and complexity.
- E. Document your findings and return the estimate to the construction cost estimator as needed to respond to review comments.

Once the construction cost estimate is complete and reviewed, the specifier/project manager is responsible for using the construction cost estimate to develop the project cost estimate.

6.5. Prepare an Independent Construction Estimate

For projects that have an estimated Total Cost Projection of at least \$5M, an independent construction cost estimate must be prepared as part of a Value Engineering process. For large, complex projects, if there is no clear best choice between the top alternatives it may also be appropriate to prepare an independent construction cost estimate during Options Analysis.

An independent estimate is a stand-alone second estimate, rather than a review of the first estimate or an estimate that takes the place of the regular estimate. An estimate reconciliation meeting is held to review and discuss any significant differences between the two estimates. All differences between the estimates must be documented. All conclusions must be summarized in writing, shared with the project team, and saved in the project files.

1. Communicate the Cost Estimate

Cost estimates are used for many purposes, some of which have additional content or formatting requirements. Links are provided below to some of the key presentation and communication requirements:

1.1. Project Team

Cost estimates should be saved in a place where the project team and other SPU employees as appropriate can view and use them. Save the completed Basis of Estimate and Cost Estimate Template (including the Total Cost, cash flow, and Total Cost Projection) to the project files, following the [project filing standards](#). Be sure to save the original estimate and all updates.

1.2. Enterprise Project Management System (EPMS)

Estimates are tracked and monitored in EPMS, and budget submittals are based on the estimates in EPMS. Project managers enter Cost Projections (i.e., escalated cash flow) in EPMS each month.

1.3. Asset Management/Stage Gates

Stage Gate forms and specific requirements are available on the [Stage Gates site](#). Stage Gate 2 requires a Total Cost for each option included in the business case and a Total Cost Projection for the recommended option. Stage Gates 3 and 4 require updated Total Cost Projections for the recommended option.

During options analysis for Stage Gate 2, the present value of life-cycle cost of each option is developed in order to help select the preferred option. Your economist will help in developing the life-cycle costs. In order to calculate a present value of life-cycle costs you will need the project cost, an annual schedule of construction, future project costs and project life. Project life can vary from 7 years for IT projects to 100-years for long-lived assets such as pipes. Life-cycle costs include all future costs. For example: operation and maintenance, replacement of equipment, and plant establishment for GSI. The project designer and field operations liaison can assist in collecting these future costs. Occasionally, the selection of an option is also based on risk costs. Again, your economist can help the team to identify and quantify risk costs.

1.4. Value Engineering

All projects with a Total Cost Projection of at least \$5M must complete a value engineering process. Ideally, value engineering is scheduled at about 30% design. The most recent detailed project cost estimate, including the Basis of Estimate, is an important input to the value engineering exercise. Roles and expectations are described in [SPU's Value Engineering Guide](#).

1.5. Change Management

Estimate updates prepared during design are used to track and manage project costs. Any significant change in project scope, schedule, or cost requires approval through SPU's [Change Management Process](#). Update the estimated Total Cost Projection and

document what costs will change and why. Variance and Change Management processes are documented in the Project Management Methodology.

1.6. Internal and External Communications

Project costs are communicated to a variety of internal and external audiences during project planning and delivery. With the exception of the options analysis performed as part of the Stage Gate 2 business case, always communicate the most current Total Cost Projection (i.e., escalated cash flow and escalated total).

Appendix A: Hard and Soft Cost Guide

Hard costs are expenditures made to construct, manufacture and/or install tangible, depreciable facilities contained in a capital improvement plan, and they can be allocated to specific CIP projects.

Soft costs are the labor and administrative expenditures associated with the planning, design, delivery and support of CIP projects.

Property, rights-of-way, and easements are neither hard nor soft costs

Hard Costs include:

- Construction contractor payments for construction of capital projects
- Utility work force used directly in the construction of capital projects
- Utility equipment (depreciable portion) directly associated with capital project construction
- Installed equipment, owner supplied or contractor supplied
- Construction materials
- Computer equipment purchased specifically for a capital project
- Acquisition and installation of monitoring equipment to support a planning or engineering process for a specific CIP project
- Building and environmental permit fees
- Mitigation and restoration
- Operating expenses incurred to "make-way", or "work-around" construction activities
- Construction notification and public information
- Testing equipment for a specific project
- Plant Establishment for one year (Additional years would be paid from O&M)

Soft Costs include:

- Planner, scientist and economist labor
- Monitoring and modeling
- Alternatives analysis
- Project management
- Project scheduling and cost estimating
- Engineering and other labor leading to final design and bid package for contracted construction, including modeling, flow monitoring and data collection, and public involvement/community outreach,
- SEPA and environmental review process
- Building and environmental permit research and application development
- Real property services labor, including ROW and acquisition research and negotiation
- Procurement document preparation
- Bid package preparation
- Bidding services for CIP projects
- Construction inspections
- Engineering services during construction
- Construction management, construction scheduling
- Engineering leading to design documents for force account construction

- Customer services
- Materials testing equipment
- Testing and Commissioning work done by SPU staff and consultants
- As-built and record drawings

Note: Some additional soft costs, such as executive management, corporate labor (e.g., human resources, finance, grants and contracts administration, legal support), and office space and equipment costs, are captured in SPU's G&A overhead rate rather than being budgeted on a project-specific basis.

Appendix B - Sales Tax Guide

Visit the [State Department of Revenue web site](#) to find the latest sales tax rate.

Taxation on Public Works projects is discussed in [WAC 458-20-171](#). This section is intended to present the rules in layman's terms.

Determining Non-Taxable Status

Requirements:

In order to be exempt from sales tax, work must meet the following requirements:

1. It must be located in a municipally owned Right of Way (separate rules apply to property owned by WA State).
2. The overall purpose of the work is to build, repair or improve facilities used primarily for foot or vehicular traffic.
3. If utilities need to be adjusted, removed, relocated or reconstructed in order to complete the roadway improvement, the utility work is considered to be part of the roadway improvement and is tax-exempt. This may include drainage and combined sewer system work under certain conditions. NOTE: If the utilities are upgraded or improved rather than replaced in kind, the utility work is considered an improvement and is taxable.

What does "tax-exempt" mean?

The WAC explains that the retail sales tax exemption applies to the Contractor's costs for labor & owned equipment needed to do the work. Materials and rental equipment are always taxed regardless of what type of work they will be used on.

Basically, what this means is that the Contractor does not get the tax exemptions - they are reserved for municipalities. The Contractor always has to pay sales tax when he purchases materials or rents equipment. This is part of his cost, and will be covered by his bid prices.

For **TAXABLE** bid items, when the City pays the Contractor, they also pay sales tax to the State Dept. of Revenue on the entire bid item price. Effectively, the sales tax is paid twice on the materials & rental equipment, because they have been sold twice (once when the contractor originally purchased them, and once when the City purchased them from the Contractor).

For **NON-TAXABLE** items, the City does NOT pay any additional sales tax to the Dept. of Revenue on the total bid item price.

For estimating purposes, material and rental costs always need to have sales tax applied, regardless of the tax status of the work as a whole (reflecting the fact that the Contractor will need to pay tax on those items when he buys them). For taxable items, the sales tax

must also be applied to the total cost for that item of work, reflecting the tax the City will pay to DOR.

Note for SPU-furnished materials: It has been a past practice to list SPU-furnished items on the bid sheet when a construction contract is advertised, usually with a bid amount already entered. This should not be done because it results in the materials being taxed twice: once when SPU purchases the materials, and a second time when the construction contractor installs the materials. Bid items for **installation** of SPU-furnished materials are appropriate.

Examples

For tax exempt work, the answers to all of these questions should be "yes". If the answer to any is "No", then the work is taxable.

- Is the work within the street Right of Way owned by the City?
- Is the purpose of the project to improve vehicular or pedestrian traffic (roadways or sidewalks)?
- Is the work necessary in order to accomplish the roadway improvement?
- Is the traveling public the ultimate beneficiary of the work?

Example 1:

- A. In a roadway improvement project, a catch basin is replaced. The catch basin bid item is NON-TAXABLE, because the purpose of the work is to improve the roadway by providing drainage.
- B. Now let's assume the purpose of the project is to replace a water main, and the catch basin needs to be removed and relocated because it is adjacent to the water main. In this case, the catch basin work is TAXABLE, because the purpose of the work was not to improve transportation facilities.

Example 2

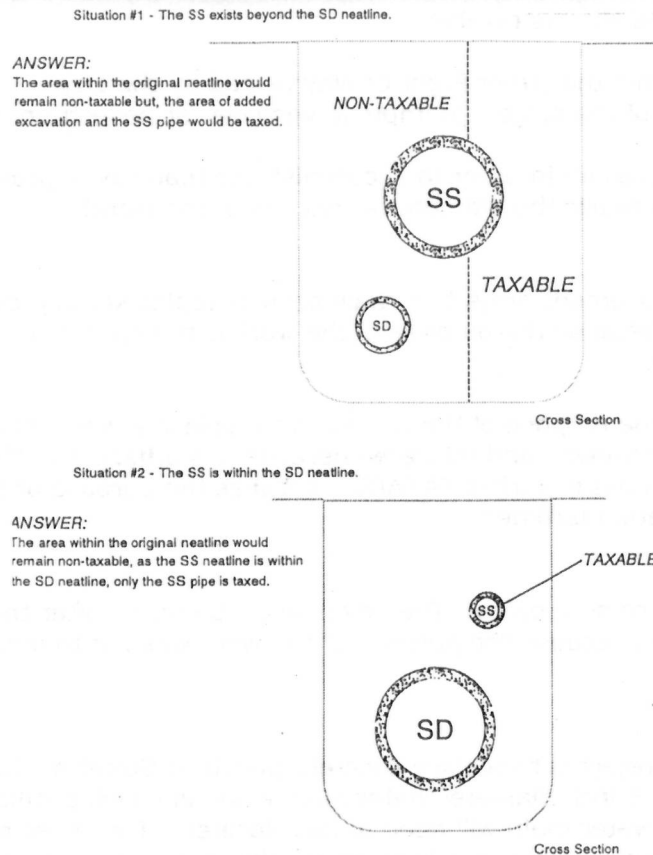
A broken sewer needs to be repaired. The pavement restoration after the repair is completed is TAXABLE, because the purpose of the work was not to improve transportation facilities.

Example 3

- A. The purpose of a project is to replace concrete panels in Street A. During removal of the existing panels, an 8-inch diameter water main is found which conflicts with the panel replacement. The water main will need to be relocated. The water main work is NON-TAXABLE, as it is required in order to complete the transportation work.
- B. The water utility decides to replace the 8-inch diameter water main with a 10-inch diameter water main. The water main work is TAXABLE, because the nature of the work has changed from replacement to improvement, and the beneficiary is now the water utility not the traveling public.

Example 4

A storm drain is being replaced as necessary to complete a roadway improvement project (i.e., non-taxable work). In the course of the work, a sanitary sewer is encountered, and it is decided that the sanitary sewer also should be replaced. Replacement is discretionary, and not required to complete the original work. The storm drain and the sanitary sewer are at different depths in the same right of way, and a single trench will be excavated to facilitate the replacements. What portion of the work is taxable, and what is tax exempt? See the following diagram for the answer.



There are some instances in which the tax exempt status of drainage and combined sewer systems may not be obvious. In these cases, SPU may want to contact the Washington Department of Revenue for a project-specific ruling prior to Stage Gate 3 to ensure that adequate funding is available.

Appendix C - Contingency and Management Reserve Examples

Contingency Reserve

Contingency Reserve is an amount added to the Base Cost to cover identified risk events that occur on the project, excluding changes in project scope.

Includes:

- Planning and estimating errors and omissions,
- Design and other changes within scope,
- Unforecasted variations in market and environmental conditions,
- Reserve to cover the risks identified in the Risk Management Plan (once a PMP has been prepared).

Does not include:

- Scope changes,
- Extraordinary, unanticipated events such as major strikes, natural disasters, and events that would be typically defined as force majeure, and
- Forecasted inflation and market conditions (which are already included in the Total Project Cost).

Contingency Reserve is sometimes described as covering the known unknowns. That is, known or identified cost risks, with an unknown outcome.

Management Reserve

Management Reserve is an amount added to the Base Cost to cover unidentified risk events that occur on the project, including minor changes in project scope.

Includes:

- Minor scope changes, and
- Other cost risks that were not explicitly identified and included in the Contingency Reserve.

Does not include:

- Major scope changes (i.e., scope changes that exceed the reserve amount and require funding approval through a Change Management Process).

Management Reserve is sometimes described as covering the unknown unknowns – that is, unknown, unanticipated or unidentified cost risks, with an unknown outcome.

Table 1: Examples of Contingency and Management Reserve.

| Example Items | Cost Risks | Base Cost | Contingency Reserve | Management Reserve | Change Management |
|---|---|-----------|---------------------|--------------------|-------------------|
| Working Downtown (identified, known outcome) | <ul style="list-style-type: none"> Less working space Restricted construction times Expensive traffic management | X | | | |
| Utility Conflicts (identified, known outcome) | <ul style="list-style-type: none"> Relocate other utilities Complex design | X | | | |
| Community Relations (identified, known outcome) (identified, unknown outcome) | <ul style="list-style-type: none"> Controversial project Requires community participation | X | | | |
| | | | X | | |
| Property acquisition fails | <ul style="list-style-type: none"> Re-design Requires minor scope change | | | X | |
| | <ul style="list-style-type: none"> Re-design Requires major scope change (i.e. new project location) | | | | X |
| Artifact found on site | <ul style="list-style-type: none"> Project is delayed. No scope change. | | X | | |
| | <ul style="list-style-type: none"> Project is delayed. Requires minor scope change | | | X | |
| | <ul style="list-style-type: none"> Project is delayed. Requires major scope change (i.e. new project location) | | | | X |
| Concrete Strike (not identified, unknown outcome) | <ul style="list-style-type: none"> Project is delayed No scope change. | | | X | |
| Poor condition of assets (not identified, unknown outcome) | <ul style="list-style-type: none"> Need to replace asset (e.g. valves) Minor scope change | | | X | |

Some of the examples illustrate that it is not the event that determines the category of reserve, but rather whether or not the cost impact was anticipated and its magnitude that determines whether it is considered to be part of Base Cost, Contingency Reserve, Management Reserve, or additional scope requiring Change Management approval.

Appendix D - Labor Overhead, Miscellaneous Fees

Labor Overhead Rates

When estimating SPU labor costs, be sure to include SPU's current labor overhead costs. For CIP work and work done for other departments, you'll need to include two overhead costs: one for employee labor benefits and one for SPU's general and administrative (G&A) costs. (For SPU O&M work, only the labor benefits overhead is applied.)

The current multipliers are maintained on [SPUForms](#).

Example:

A CIP project manager's hourly salary rate is \$45. For each hour that the project manager will work on the project, the project cost is calculated as follows:

$$\begin{aligned} \text{Project Cost/Hour} &= \text{hourly salary rate} \times (1 + \text{labor benefits rate} + \text{G\&A rate}) \\ &= \$45/\text{hour} \times (1 + 0.60 + 0.96) \\ &= \$45/\text{hour} \times (2.56) \\ &= \$115.20/\text{hour} \end{aligned}$$

SPU Non-Construction Vehicles

Project Soft Cost estimates should include an amount for SPU non-construction vehicles. The actual amount typically is between 0.3% and 0.4% of the Base Cost.

SPU 1% for Art Program Funding

SPU's 1% for Art Program is centrally funded. Do not include this item in your project cost estimate.

Seattle Design Commission Fees

Design Commission fees are centrally funded. Do not include this item in your project cost estimate.

Purchasing and Contracting Services Division (PCSD) Fees

Finance and Administrative Services' (FAS's) Purchasing and Contracting Services Division is responsible for public works contracting in the City of Seattle. PCSD charges for their services, and the charges are allocated to each project. Project-specific charges are based on the total number of City construction contracts and the value of each contract. Typically, PCSD fees are between 0.75% and 1% of the estimated construction contract amount. For small projects assume 1%, and for large projects use 0.75%.

SDOT ROW Fees

For projects located within the City of Seattle street right-of-way (ROW), the project will need to pay SDOT street use fees that take into consideration the project size and the length of time that the project will affect use of the street ROW. A copy of the current fee schedule is available on [SDOT's website](#).

